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TITLE: DEVELOPMENT OF THE OMPAT NEUROPSYCHOLOGICAL/PSYCHOMOTOR PERFORMANCE EVALUATION AND OMPAT DATA AND TIMING SUPPORT PROGRAMS

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software timermodule that could be incorporated into OMPAT and other testing
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system integrity, 3) to construct a version of UTCPAB that incorporates the
software timer.

UTC-PAB; Computerized; Battery; Neuropsychological;
Millisecond timer; MIPR; RA V; Humans; Performance; Analysis

FOREWORD

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1. INTRODUCTION

This annual report provides a summary of FY91 work completed towards the development of software timing programs and specified OMPAT Level I and II Performance Assessment Batteries that incorporated timing support programs. This effort was accomplished at the Navy Computer and Telecommunications Station.

The objectives of this project have been: 1) to create a millisecond accuracy software timer module that could be incorporated into OMPAT and other testing programs, 2) to construct a set of automated, i.e., "computerized" OMPAT Level I neuropsychological and psychomotor tests with documentation that provide a standardized, clinically relevant, and rapid method for assessment of nervous system integrity, 3) to construct a version of UTCPAB that incorporates the software timer.

Previously developed computerized testing software provided data and information for human performance researchers but was often "hard coded" for a specific types of research and/or equipment. As a result it was frequently unadaptable for other similar human performance research projects because of constraints due to available time, space, and/or economic constraints, etc.

Computerized software developed to date, requires no additional equipment (i.e., special timing cards) other than a standard IBM AT compatible personal computer. Our testing software has been constructed to allow the administration of tests individually, i.e., as single or "standalone" tests, or to be incorporated into a standardized battery that could be configured by the researcher.

2. METHODS

Software programs were created to meet OMPAT specifications as described as followed: Software includes timing modules to provide millisecond accuracy for subject/patient response times. All program modules developed are compatible in data format, instruction formats, and tests structure to existing OMPAT batteries (e.g., UTC-PAB/AGARD STRES Battery.) This standard for testing software will provide for ease of use for all researchers and versatility of software usage. Design characteristics incorporated into the test software are as follows:

1) Local area networking (LAN) capability allowing for simultaneous subject testing in a controlled laboratory or field site. A level of security for test software is provided, as the individual subjects data and test setups may be stored at a location other than where the test software resides (a fileserver or alternate disk drive). There is no test program requirement for writing information in the area where the testing software exists so software may be protected from the subject.

2) The ability to test a specified domain of neuropsychological functions including sensory, perceptual and cognitive abilities.

3) Sensitivity to detect the interactive and independent effects of chemical agents and other stressors,i.e., heat, cold, and fatigue on neuropsychological functions.

4) Compatibility with existing normative databases for comparison of test results with standardization samples such as age, education, and occupational norms.

5) Multiple options for ordering subtests, storage and presentation of test data.

6) Operator control of stimulus presentation order, length of interstimulus intervals, duration of test, results feedback, composition of test instructions, response key definitions, size of stimulus display.

3. RESULTS

Neuropsychological performance evaluation software has been developed specifically designed to screen for deficits in the following domains: attention, memory, verbal skills, spatial skills and motor performance. The Level I Automated Neuropsychological Assessment Metrics (ANAM) is a collection of individual tests that can be run independently or run with the ANAM menu system as a test battery. It is extremely versatile at the single test level and may be used for human performance measures by the clinician or researcher. Initial beta testing sites for this battery has involved a diverse arena ranging from supporting neurodiagnostic procedures, evaluation of brain injury patients and clinical neuropsychological testing to sustained operations performance testing, ship motion research and human performance research with environmental stressors.

4. CONCLUSIONS

Development of automated neuropsychological assessment software has broadened the scope of OMPAT sponsored and other human performance research. There has been a recognized need for dynamic software, versatile enough to be used as clinical, laboratory, and field test measures, yet easily re-configured and modifiable to meet hybrid needs of the laboratory research. Testing software is being developed and appropriately structured to meet demands for human performance evaluation at several levels, providing greater depth for developing human performance databases. Test software is being structured and implemented to meet the needs of the area of human performance to be evaluated not limited to the criteria of a specific research project or clinical procedure.

APPENDIX

TECHNOLOGY TRANSFER

Transferred human performance neuropsychological testing
software to NAMI, Pensacola NAS for evaluation.
Provided onsite installation and training.

Transferred human performance neuropsychological testing
software to NBDL, New Orleans NAS for use in ship motion research.
A setup, installation procedure and software demonstration
was provided at Pensacola NAS.

Transferred human performance neuropsychological testing
software to USAARL, Ft Rucker for human performance research. A demonstration of
software and installation procedures was provided at Pensacola NAS.

Transferred upgraded STRES software to NAMRL, Pensacola NAS for use in sustained
operations performance testing.

Transferred upgraded STRES software to USAFSAM Brooks AFB,
San Antonio for use in performance testing.

Transferred human performance neuropsychological testing software to National
Rehabilitation Hospital,Washington,DC for evaluation of brain injury patients. A setup,
installation and demonstration of software was provided at NRH.

Transferred human performance neuropsychological testing software to Krug International
Life Sciences to support ongoing NASA research at the Johnson Space Center, Houston,TX.

Transferred human performance neuropsychological testing software to the University of
Massachusetts Medical Center to support ongoing research in neuropsychological
assessment. A setup, installation and demonstration of software was provided.

Transferred human performance neuropsychological testing software to Georgetown
University Medical Center, Department of Neurology, Washington,DC to support
neurodiagnostic procedures. A setup,installation and demonstration of software was provided
at GU.

Presentation and Publications

Reeves, D., Schlegal, R., Guilland, K. and Crabtree, M..
UTC-PAB and the NATO/AGARD STRES Battery: Results from standard-ization studies.
Proceedings of the 1991 Medical Defense Bioscience Review. Aberdeen Proving Grounds,
MD, 1991.

Winter, K. and Reeves, D.   Update and Software Demonstration of UTC-PAB, ANAM and
AAMS. Presented at the OMPAT Technical Advisory Group Meeting, 06 AUG 1991.

Hegge, F., Elsmore, T., Reeves, D.   Office of Military Performance and Assessment
Technology (OMPAT): Demonstration of OMPAT Software Products. Presented at the
1991 Army Research Psychologist (68T) Meeting, Silver Spring, MD 16-19 SEP 1991.

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